

PRELIMINARY OBSERVATIONS ON THE LUNAR AND TIDAL INFLUENCES ON THE CATCHES OF SEER BY GILL NETS

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The paper deals with the lunar and tidal influences on the catches of seer by gill nets. The landings during full-moon and new-moon nights, during low and high tides and during different quarters of the lunar month for three fishing seasons are discussed.

INTRODUCTION

Of the total production of seer (*Scomberomorus* spp.) in India, 76% is landed in the states of Andhra Pradesh, Tamilnadu and Kerala. The chief gear employed for the capture of this commercially significant fish remains to be the gill net. The nets are usually operated during nights and bottom, column and surface drifting are resorted to. It is a common belief that seers are caught in abundance during the new-moon nights compared to

fullmoon nights. It is also believed that operations during low tide are more favourable than those during high tide. Though the extent of the relationship between the abundance of fish and the lunar and the tidal influences is not yet correctly estimated, scientific investigations in this direction have already been initiated both by Indian and foreign workers. The importance of this information, for economic and efficient operation of the gear, is therefore, well recognised.

(Continued from page 64)

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Isomae (1894), in his account of drift nets for bluefin tuna, observed that the number of tuna gilled on dark nights was greater than that on moonlit nights. Savage and Hodgson (1934) recorded that the herring drift net catch on the east coast of England is greatly influenced by the phase of the moon. Similarly, in Taiwan, Liu (1957) found that the degree of variation in the catch is related to the phase of the moon or to the sequence of the tides. Subramanyam (1965) also, while studying the lunar, diurnal and tidal productivity in relation to the abundance of prawns, observed a significant relationship between prawn catches and the lunar, diurnal and tidal rhythms. Nomura (1959 and 1961) and Hopson (1962) are further of the opinion that moon is only one of the several factors influencing the behaviour of fish. As no similar information which is vital for the efficient and economic operation of the gill nets for seer is available, the authors have made an attempt to study the lunar and tidal influences on the catch of seer and certain preliminary observations are presented in this communication.

MATERIALS AND METHODS

The materials for the studies were collected during the fishing experiments conducted with gill nets designed for the capture of seer. The operations were limited to below 30 m (16.5 fms) depth in the grounds off Cochin and observations were made for three consecutive fishing seasons of the years 1966-67, 1967-68 and 1968-69. The fishing season normally extends for six months commencing from October to March. The gear was drifted along the surface for 3 hrs from 6 pm to 9 pm on all the days of fishing. The phase of the moon was followed as per the Indian calendar taking each month as a lunar month of 28 days. The total numbers of seer caught during each full-moon night

and new-moon night and during low and high tides were recorded separately. The numbers of seer landed during each quarter of the lunar month were also separately estimated.

RESULTS & DISCUSSIONS

The total number of operations along with the numbers of seer caught during the operations on full-moon nights and new-moon nights of each fishing season are given in Table 1. The total number of hauls and corresponding numbers of seer caught during each quarter of the 'lunar month' of each fishing season are tabulated in Table II. Table III represents the number of hauls during low and high tides and the respective catch of seer.

Out of a total of 48 hauls, 24 were made during the new-moon nights and the balance during the full-moon nights. The landings (Table I) indicate that the new-moon nights are better for the capture of seer than the other ones.

In order to see whether any significance can be attached to any particular quarter of the lunar month, the data for the numbers of seer caught during the four quarters were subjected to chi-square (χ^2) test. The calculated chi-square with 3 d. f. was 28.02 which is significant at 1% level, indicating that the numbers of seer caught in the different quarters of

Table I Variation in the catches of seer during the new-moon and the full-moon nights.

Year	New-moon nights		Full-moon nights.	
	Total no of hauls	Total no of seer	Total no of hauls	Total no of seer.
1966-67	11	40	11	28
1967-68	7	34	7	43
1968-69	6	22	6	15
Total	24	96	24	86
Catch/haul (nos)		4		3.58

Table II Catch details of seer during the four quarters of the lunar month

Fishing season	First quarter No of hauls	No of seer	Second quarter No of hauls	No of seer	Third quarter No of hauls	No of seer	Fourth quarter No of hauls	No of seer.
1966-67	7	27	4	13	8	23	3	5
1967-68	5	24	2	10	5	34	2	9
1968-69	2	12	4	10	4	6	2	9
Total	14	63	10	33	17	63	7	23
Catch/haul		4.5		3.3		3.7		3.28

Table III Catch details of seer during high and low tidss

	High tide	Low tide
No of hauls	12	36
Total catch (nos)	32	150
Catch/haul (nos)	2.66	4.16

the lunar month are significantly different. The χ^2 calculated for the catch in the first and third quarters alone does not reveal any significant difference between them. The calculated χ^2 with 1 d.f. for the first and third, and second and fourth quarters were respectively 0 and 1.80.

The fishing conditons during the first and third quarters were more favourable than the second and fourth quarters, as evidenced by the rate of landing (Table II) Though visibility factor of the gear, due to the moon-light in the fourth quarter, might have resulted in a poor landing of seer during that period, the results of the operation during the second phase, makes it clear that, it is not the only factor which affects the seer landings, because, all the hauls during the second quarter were made in the darker nights. Liu (*op cit*) has already shown that the variation in the catches of demersal fishes is related to the phase of the moon as well as to the sequence of the tide. Subramanyam (*op cit*) has also correlated the above phenomenon with respect to that of prawns.

The landings of seer during the

operations at high and low tides, were further tested statistically to see the significance. The catches of seers during low tide operations were significantly more compared to those during high tide ($t_s=3.213$, which is significant at 5% level). The catch per haul during low tide was 1.56 times more than that during high tide (Table III).

Thus, the probable reason for a low rate of landing of seer during the second quarter of the lunar month can be attributed to the greater number of operations during high tide. Out of a total of 10 hauls in the quarter, 6 were during the high tide (Table IV).

The observations, though of preliminary nature, indicate that moon is not the only factor which influences the variation of seer catches; but it is also influenced by the tidal rhythms. A darker night

Table IV No of hauls in low and high tides and catch/haul during each quarter of the lunar month.

Phase of moon	First quarter	Second quarter	Third quarter	Fourth quarter
No of hauls during high tide.	2	6	1	3
No of hauls during low tide.	12	4	16	4
Total hauls	14	20	17	7
Catch/haul (nos)	4.5	3.3	3.7	3.28

with a low tide is the best period for the efficient capture of seer fish than a moonlit night with high tide.

SUMMARY

There exists a significant relationship between the catch of seer and the lunar phase and the tidal rhythms. The moon is not the only factor which affects the seer landings. The best period for the efficient exploitation of the gear for seer is darker nights with low tide.

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